

**Bonneville Power Administration
Fish and Wildlife Program FY99 Proposal**

Section 1. General administrative information

Umatilla Hatchery Operation And Maintenance

Bonneville project number, if an ongoing project 8903500

Business name of agency, institution or organization requesting funding
Oregon Department of Fish and Wildlife

Business acronym (if appropriate) ODFW

Proposal contact person or principal investigator:

Name Trent W. Stickell
Mailing Address Oregon Department of Fish and Wildlife P.O. Box 59
City, ST Zip Portland, Oregon 97207
Phone (503) 872-5252
Fax (503) 872- 5632
Email address trent.w.stickell@state.or.us

Subcontractors.

Organization	Mailing Address	City, ST Zip	Contact Name
NA			

NPPC Program Measure Number(s) which this project addresses.

7.0c.4, 7.2D, 7.2D.1, 7.4I 1, 7.4L, 7.4L1

NMFS Biological Opinion Number(s) which this project addresses.

This project relates to the Biological Opinion for 1995-98 Hatchery Operations in The Columbia River Basin, Section 7 consultation, Endangered Species Act: 1) wire tag 100% of fall chinook, 2) provide straying information, 3) conduct fish health checks.

Other planning document references.

Response: Wy-Kan-Ush-Me-Wa-Kush-Wit, vol.II. pp. 42-45; The Umatilla Hatchery Master Plan (ODFW & CTUIR, 1990); The Umatilla River Subbasin Salmon & Steelhead Plan (ODFW & CTUIR, 1989); and The Umatilla Basin Project-Initial Project Workplan (USBR & BPA 1989).

Subbasin.

Umatilla River subbasin.

Short description.

Umatilla Fish hatchery produces the majority of the fish production for the purposes of rehabilitating chinook salmon and enhancing steelhead populations in the Umatilla River.

Section 2. Key words

Mark	Programmatic Categories	Mark	Activities	Mark	Project Types
X	Anadromous fish		Construction		Watershed
	Resident fish	X	O & M		Biodiversity/genetics
	Wildlife	+	Production		Population dynamics
	Oceans/estuaries		Research		Ecosystems
	Climate		Monitoring/eval.		Flow/survival
	Other		Resource mgmt		Fish disease
			Planning/admin.	X	Supplementation
			Enforcement		Wildlife habitat enhancement/restoration
			Acquisitions		

Other keywords.

NA

Section 3. Relationships to other Bonneville projects

Project #	Project title/description	Nature of relationship
8902401	Juvenile salmonid outmigration and survival in the Umatilla River	Migration monitoring assist in evaluating in-basin migration success of different rearing/release strategies.
9000501	Natural Production Monitoring and Evaluation-natural production success.	This study evaluates the amount and extent of salmonid natural production in the Umatilla Basin. Identification is critical to determining the success of the hatchery programs designed to restore and supplement natural populations.
8802200	Umatilla River Basin Trap and Haul Program-collect /transport juvenile fish	This project provides low water passage for fish in the Umatilla River by trapping fish and hauling them to sections of the river with adequate flow.

Section 4. Objectives, tasks and schedules

Objectives and tasks

Obj 1,2,3	Objective	Task a,b,c	Task
1	Project Coordination		In a coordinated effort with the co-managers, develop a Annual Operating Plan for the Umatilla Hatchery Production Program and related activities.
		b	In a coordinated effort with the co-managers, participate in Hatchery Management and Research Review Meetings.
		c	In a coordinated effort with the co-managers, participate in Umatilla Oversight Quarterly Meetings.
2	Fish Management - Fish culture activities.	a	Feed & monitor spring chinook 8x /day, 7 days /week.
		b	Feed & monitor summer steelhead 8x/day, 7 days / week.
		c	grade summer steelhead
		d	Clean spring chinook Michigan ponds daily.
		e	Clean spring chinook Oregon ponds once per week.
		f	Clean summer steelhead Michigan ponds daily
		g	Monitor / adjust oxygen levels
		h	Monitor and adjust water flows in hatchery wells.
		i	Treat fish as nesessary to control diseases.
		j	spawn fall chinook and transfer eggs to Umatilla hatchery.
		k	Inventory and tray down eggs; Incubate and treat eggs with formalin and/or other approved chemicals to control fungus as needed until hatching.
		l	Shock and separate viable from non-viable eggs and conduct an

			eyed egg inventory.
		m	Purchase fish feed for all fish groups.
		n	Transfer Spring Chinook to Acclimation ponds
		o	Pond fall chinook fry
		p	Feed and monitor fall chinook subyearlings 8x / day 7 days / week.
		q	Clean fall chinook Michigan ponds daily.
		r	Administer disease control measures as required to fall chinook subyearlings.
		s	Coordinate marking/tagging operations for subyearling fall chinook.
		t	Facilitate marking/tagging operations for subyearling fall chinook.
		u	Spawn and transfer summer steelhead eggs to Umatilla Hatchery.
		v	Inventory and tray down summer steelhead eggs; Incubate and treat eggs with formalin or other approved chemicals to control fungus as needed until hatching.
		w	Shock and separate viable summer steelhead eggs from non-viable eggs and conduct an eyed egg inventory.
		x	Transfer fall chinook to acclimation ponds.
		y	Pond spring chinook from incubators into small rearing tanks.
		z	Feed and monitor spring chinook in small rearing tanks.
		a	Pond summer steelhead from incubators into small rearing tanks.
		b	Transfer spring chinook from small rearing containers to outside ponds.
		c	Transfer summer steelhead from

			small rearing containers to outside ponds.
		d	Feed and monitor summer steelhead in Oregon ponds 10x / day.
		e	Spawn and transfer spring chinook eggs to Umatilla Hatchery; inventory and tray down eggs; incubate and treat spring chinook eggs with formalin or other approved chemicals to control fungus as needed until hatching.
		f	Shock and separate viable from non-viable spring chinook eggs and conduct an eyed egg inventory.
		g	Coordinate marking/tagging operations of spring chinook yearlings.
		h	Facilitate marking /tagging operations of spring chinook.
		i	Complete and submit all required reports to Fish Propagation Portland.

Objective schedules and costs

Objective #	Start Date mm/yyyy	End Date mm/yyyy	Cost %
0	10/1998	9/1999	5.00%
2	10/1998	9/1999	95.00%
			TOTAL 100.00%

Schedule constraints.

Continuation of this program may be contingent upon the renewal of the Biological Opinion for 1995-98 Hatchery Operations in the Columbia River Basin.

Completion date.

Ongoing O&M.

Section 5. Budget

FY99 budget by line item

Item	Note	FY99
Personnel	Salaries	\$271,406
Fringe benefits	OPE @ 37%	\$100,420
Supplies, materials, non-expendable property		\$60,504
Operations & maintenance		\$242,762
Capital acquisitions or improvements (e.g. land, buildings, major equip.)		\$10,500
PIT tags	# of tags:	
Travel		
Indirect costs	@23%	\$137,117
Subcontracts		
Other		
TOTAL		\$822,709

Outyear costs

Outyear costs	FY2000	FY01	FY02	FY03
Total budget	\$880,000	\$942,000	\$1,008,000	\$1,078,000
O&M as % of total	100%	100%	100%	100.00%

Section 6. Abstract

Umatilla Hatchery was authorized under the Northwest Power Planning Council's (NPPC) Fish & Wildlife Program and began operation in 1991. Hatchery funding (100%) is provided by BPA. The hatchery is used for egg incubation and rearing of spring chinook, fall chinook, and summer steelhead. Umatilla Hatchery serves as the foundation for rehabilitating chinook salmon and enhancing steelhead in the Umatilla River. Fish released into the Umatilla River are expected to contribute significantly to the NPPC doubling goal in the Columbia River Basin. Monitoring and evaluation of the hatchery rearing (Project #9000500) includes: 1) information provided on culture and release of hatchery fish, harvest regulations, and natural escapement that will lead to the accomplishment of long-term natural and hatchery production goals in the Umatilla River Basin in a manner consistent with provisions of the Council's Fish & Wildlife program; and 2) assess the success of achieving the management objectives in the Umatilla River Basin that are presented in the Master Plan and the Comprehensive Rehabilitation Plan. Hatchery studies focus on the production of fish reared in the Michigan raceways using oxygen supplementation, and the success of different rearing and release strategies. This rearing system has not been thoroughly evaluated and the results may have systemwide

application in the Columbia River Basin. Experiments and methods follow the criteria established in the comprehensive study plan. It is expected that the Umatilla Hatchery production program will ultimately provide the desired numbers of adult returns to the Umatilla River as identified in the Umatilla Hatchery Master Plan (1989) and supplement(1993). However with reduced water flows, Umatilla Hatchery will be operating at reduced fish production levels. The reduced production level goals for FY 1999 are: 360,000 spring chinook yearlings (45,000 pounds), 2,682,000 fall chinook subyearlings (44,700 pounds), and 150,000 summer steelhead (25,000 pounds).

Section 7. Project description

a. Technical and/or scientific background.

Response: The Umatilla River once supported large runs of spring and fall chinook, coho, and summer steelhead which provided productive fisheries for both Indians and non-indians. Runs of chinook and coho salmon were effectively eliminated from the Umatilla River over 66 years ago and summer steelhead runs have declined from historic levels. Salmon introduced into the river in 1983 are now returning but only at a fraction of historic levels. The decline of summer steelhead and the elimination of other salmonids in the Umatilla River was largely attributed to the construction of the Columbia River hydroelectric dams and hydroelectric and irrigation diversions on the Umatilla River. The Hermiston Power and Light Hydroelectric project (RM 10) and Threemile Falls Dam (RM 3) irrigation diversions on the Umatilla River in 1910 and 1914 respectively, are believed to have caused the largest decline of salmon and steelhead in the Umatilla basin. Additional fish losses in the basin have resulted from habitat degradation and depletion of stream flows through irrigation.

The Umatilla Hatchery was authorized under the NPPC's Fish and Wildlife Program and began operation in 1991. Hatchery funding is provided by the BPA. The NPPC authorized the hatchery construction to produce up to 290,000 pounds of salmon and steelhead annually for release into the Umatilla River basin. This production is designed to partially mitigate for fish losses caused by hydroelectric dams on the Columbia River and to use artificial propagation as a component of the Umatilla fisheries restoration program to achieve natural and hatchery adult return goals as described in the Umatilla Hatchery Master Plan and supplement.

The Umatilla Hatchery is the foundation for rehabilitating chinook salmon and steelhead in the Umatilla River. In fact, rehabilitation of anadromous fish stocks in the Umatilla River Basin requires the restoration of spring and fall chinook salmon and supplementation of summer steelhead (Boyce, 1986). Increased populations of Umatilla River salmon and steelhead have resulted from artificial and natural production (CTUIR & ODFW, 1990). These efforts were intended to provide offsite mitigation for Columbia River Basin salmon losses (NPPC, 1987). The fisheries restoration program in the Umatilla River basin has produced adult returns that partially mitigate for lost fisheries (Keefe et al. 1993, 1994; Hayes et al. 1996a, 1996b; Focher et al. 1997; Groberg 1996a,

1996b, CTUIR 1994; Contor et al. 1995, 1996,1997). The comprehensive Plan (Boyce, 1986) identified the need for evaluating survival of hatchery and naturally produced smolts throughout the entire river basin. In addition, the Fish and Wildlife Plan (NPPC 1994) specified that biological monitoring is needed to provide information for updating subbasin plans, for improving management and conservation of natural populations, for assessing the effectiveness of hatchery rearing and release strategies (including acclimation), and for supplementation research.

b. Proposal objectives.

Response: The NPPC's Fish and Wildlife Program authorized the construction of Umatilla hatchery to produce up to 290,000 pounds of salmon and steelhead annually for release into the Umatilla River basin. This production is designed to: 1) Partially mitigate for fish losses caused by hydroelectric dams on the Columbia River, 2) Use artificial propagation as a component of the Umatilla fisheries restoration program to achieve natural and hatchery adult return goals as described in the Umatilla Fisheries Restoration Plan to achieve natural and hatchery adult return goals as described in the Umatilla Hatchery Master Plan (1989) and Supplement (1993), 3) Test Michigan – versus Oregon – type rearing strategies (oxygen supplementation) and other experimental and supplemental rearing strategies, and 4) Contribute to the NPPC's goal for the Columbia Basin to “double the total number of adult salmon and steelhead in the Columbia Basin as fast as possible without further loss of biological diversity among or within anadromous and resident fish populations.

Fish Production at Umatilla Hatchery is limited to 165,000 pounds due to a production cap in the Umatilla Hatchery EIS. The plan objectives are to initiate and complete all O&M activities, continue routine hatchery operations (spawning, incubation, rearing, transfer, and disease control of spring chinook yearlings, fall chinook subyearlings, summer steelhead smolts), initiate necessary facility upgrades and continue routine ancillary actions.

The CTUIR and ODFW have established an annual run size goal (in terms of adult returns to the Umatilla River) of 11,000 natural and hatchery produced spring chinook (1,000 natural, 10,000 hatchery) by the year 2006. Achievement of these goals will be accomplished primarily by the release of smolts produced at Umatilla Hatchery, Northeast Oregon facilities, and other hatcheries in the Columbia River Basin.

The annual run size goal for upriver bright fall chinook (URB) is 21,000 natural and hatchery produced fish (11,000 natural, 10,000 hatchery). The goal for summer steelhead is an annual adult return of 9,670 fish. It is estimated that it will take about 15 years to meet the target adult return goals (by year 2006). At full production (290,000 pounds) Umatilla Hatchery should be able to produce 100% of the summer steelhead, 85% of the upriver bright fall chinook, and 34% of the spring chinook required to meet the adult return goals outlined in the Umatilla Hatchery Master Plan.

c. Rationale and significance to Regional Programs.

Response: Results of research on the effectiveness of rearing salmon and steelhead in Michigan and Oregon raceways at Umatilla Hatchery may have significance to restoration and rearing programs throughout the Columbia basin. The Michigan system is designed to rear fish at high densities using oxygen supplementation. However, this system has not been thoroughly evaluated to determine the effects on smolt-to-adult survival for chinook salmon and steelhead. If fish can be reared efficiently at high densities in Michigan raceways, significant savings may result in the form of reduced construction, water, and production costs. Additional studies on size and time of release and acclimation will have application to other restoration and supplementation programs.

The evaluation of rearing and survival success (Project #9000500) is critical to the restoration program in the Umatilla River and to the NPPC's doubling goal for the Columbia basin. Umatilla Fish Hatchery is the foundation for rehabilitating chinook and salmon and enhancing steelhead in the Umatilla River. Therefore, analysis of the factors affecting juvenile and adult survival are needed to ensure program success.

Past monitoring has shown that adult fall chinook salmon from releases made into the Umatilla River stray into the Snake River system. The tagging program currently tags more than 3 million fish annually and early results show that significant numbers of fish can be removed at Lower Granite Dam thus reducing the numbers passing over the dam. Removal of these strays assists the restoration program for the listed stocks of fall chinook salmon in the Snake River. Marking studies are incomplete, but have provided valuable information on the use of body-tags as a mass mark.

As part of the CTUIR and ODFW Umatilla Fishery Rehabilitation Program being implemented under the NPPC's Fish and Wildlife Program [Section 1403 (4.2,4.6)], passage, flow, and habitat conditions are being improved. These projects are designated to support the hatchery supplementation program and enhance existing and future natural production in the subbasin.

Screens and fishways at the five major water diversions in the lower Umatilla River (Threemile Dam, RM 3; Maxwell, RM 15; Westland, RM 27; Cold Springs, RM 29; and Standfield, RM 32) have been reconstructed to improve downstream and upstream survival of salmon and steelhead. A smolt trapping facility has been constructed at Threemile Dam and a smolt trapping facility at Westland, to collect and transport smolts and adults around lower river diversions during periods of low water flow.

The CTUIR, ODFW, and Bureau of Reclamation (BOR) have designed both interim and long-term projects to address water flow problems in the Umatilla basin. The CTUIR and ODFW have developed an interim flow enhancement project to increase flows in the

Umatilla River prior to implementation of the BOR Umatilla Basin Project. These plans have included use of West Extension Irrigation District pumps to improve water flow below McKay Creek (RM 51). The success of these interim efforts has varied because of limited water availability during low rainfall years.

The Umatilla Basin Project was developed by the BOR in conjunction with the CTUIR, ODFW, and local agricultural, irrigation, and civic organizations. The Umatilla Basin Project is designed to achieve long-term fishery goals and alleviate water use conflicts in the Umatilla Basin. Project features are designed to meet stream flow objectives of 250 to 300 cfs during migration periods throughout the lower 51 miles of the mainstream Umatilla River. The project includes 2 phases of implementation. Phase I provides a pumping facility to exchange water with the West Extension Irrigation District and increase flows below Threemile Dam. Phase II is a larger Columbia River pumping complex designed to deliver water to Herminston and Standfield Irrigation Districts (via Cold Springs Reservoir) and increase water flows below McKay Creek during critical fish migration periods. Phase I was completed in the fall of 1992 and Phase II is scheduled for completion in 1998. This completion date is dependent upon congressional funding appropriations for the Basin Project.

The CTUIR, ODFW, and Forest Service have implemented a habitat enhancement plan for the Umatilla River and tributaries. Habitat improvements are planned to improve spawning and rearing habitat for naturally spawning summer steelhead and spring chinook. Additional habitat improvement needs have been identified in the Umatilla River Subbasin Salmon and Steelhead Plan (Umatilla Subbasin Plan) and are proposed for implementation in the NPPC's Integrated System Plan (1991). The future program is designed to emphasize watershed-wide land use causative factors and related improvements affecting fisheries habitat.

Beginning in 1981, ODFW began reprogramming hatcheries to supply salmon and steelhead smolts for the Umatilla River. Umatilla Fish Hatchery was constructed and began operation in the fall of 1991. Construction of the Umatilla Hatchery adult and juvenile satellite facilities began in 1983 and have been completed with the exception of 1 acclimation facility.

d. Project history

Response: The Umatilla Hatchery was authorized under the NPPC's Fish and Wildlife Program and began operation in the fall of 1991. Hatchery funding is provided by the BPA. The hatchery is used for egg incubation and rearing of spring and fall chinook and summer steelhead. Four satellite facilities (Bonniifer Pond, Minthorne pond, Imeques, and Thornhollow) are used for juvenile acclimation. The Threemile facility is used for adult collection and holding.

Since Umatilla Hatchery began operation in 1991, approximately 18.7 million upriver bright fall chinook (17.5 million produced at Umatilla Hatchery), 6.5 million spring chinook (5.2 million produced at Umatilla Hatchery, and 948 thousand summer steelhead (941 thousand produced at Umatilla Hatchery) have been released into the Umatilla River basin. In addition, approximately 7.1 million coho salmon smolts have been released into the Umatilla River Basin from lower Columbia River Mitchell Act funded hatchery facilities.

The Umatilla Hatchery Monitoring and Evaluation Project #900500, has been underway since 1992. Research was developed out of the needs addressed in hatchery technical work group meetings, the Umatilla Hatchery Master Plan (CTUIR & ODFW, 1990), and the Comprehensive Plan for Monitoring and Evaluation (Carmichael, 1990). Personnel associated with this project have completed 6 years of monitoring and evaluation of fish reared at Umatilla Hatchery (Keefe et al. 1993, 1994; Hayes et al. 1996a, 1996b; Focher et al. 1997; Hayes et al. 1997, Carmichael, in press). Additional studies have been conducted for groups released in the Umatilla River, but reared at other hatcheries including Bonneville, Cascade, Irrigon, Little White Salmon, and Willard. A considerable amount of information has been obtained on juvenile rearing and migration success however, the information on adult survival, which is critical to evaluating the success of rearing and release studies is still being collected. Refer to Project #9000500 for a summary description of results observed.

Other project reports and / or papers include: 1) Monthly Progress Reports submitted to ODFW Portland and BPA no later than 15 days after the end of the month, 2) Umatilla Basin Annual Operating Plan (AOP) setting forth details of the operation of the hatchery consistent with a) Provisions of the Hatchery Management Plan (HMP) approved by the NPPC in October 1989; and b) Fish Hatchery operations policies required in Oregon State Administrative Rules (OAR), Chapter 635-007-0510 through 0590. A proposed AOP is to be submitted to BPA at least 6 months prior to the start of a New fiscal year (by March 31), 3) Section 7 Biological Assessment and Biological Opinion for Hatchery Operations in the Columbia River Basin, 4) Intergrated Hatchery Operations Team (IHOT) Operation Plans for Anadromous Fish Production Facilities in the Columbia River Basin, vol. II, annual report, 1995. BPA.

.

e. Methods.

Response: For fiscal year 1999, implement actions as set forth in detail within the Umatilla Hatchery and Basin Annual Operation Plan (AOP), submit Monthly Progress Reports as specified in Reporting Requirements section of BPA Intergovernmental agreement, and submit to BPA by March 31, 1999 a proposed AOP for fiscal year 2000. IHOT recommended policies and procedures will be incorporated into the fish culture operations in order to achieve the following objectives (IHOT 1995, Annual Report.

Operation Plans for Anadromous Fish Production in the Columbia River Basin, pp. 277-296).

Objective 1: The proposed annual salmon and steelhead production at Umatilla Hatchery with designed water flows is: 5,940,000 subyearlings (99,000 lbs.) of upriver bright fall chinook; 210,000 yearlings (42,000 lbs.) of spring chinook, 1,080,000 subyearlings (72,000 lbs.) of spring chinook, and 210,000 yearlings (42,000 lbs.) of summer steelhead.

Due to decreased well water flows which has limited the fish production capabilities at Umatilla Hatchery, the reduced fish production goals for FY 1999 will be 360,000 spring chinook (45,000 pounds), 2,682,000 subyearling upriver bright fall chinook (44,700 pounds), and 150,000 steelhead (25,000 pounds).

Objective 2: Minimize interactions with other fish populations through proper rearing and release strategies.

Objective 3: Maintain stock integrity and genetic diversity of each unique stock through proper management of genetic resources.

Objective 4: Maximize survival at all life stages using disease control and disease prevention techniques. Prevent introduction, spread, of amplification of fish pathogens.

Objective 5: Conduct environmental monitoring to ensure that hatchery operations comply with water quality standards and to assist in managing fish health.

Objective 6: Communicate effectively with other fish producers, managers, and the public.

The specific hatchery effectiveness analysis is conducted within the M&E Project #9000500 which includes monthly length, weight, and smolt condition data, smolt performance, outmigration survival, counts of returning adults, analysis of adult survival data, monitoring of sport fisheries for chinook salmon and steelhead, annual evaluations of past performance which is used for development of new Hatchery Annual Operations Plans (AOP).

It is expected that the Umatilla Hatchery production program will ultimately provide the desired numbers of adult returns to the Umatilla River as identified in the Umatilla Hatchery Master Plan (1989) and Supplement (1993). However, with reduced well water availability, and the resultant reduced fish production capability, this goal becomes more difficult to achieve.

The operation of Umatilla Hatchery and its associated facilities are included within the most recent Biological Opinion issued by NMFS on April 11, 1995. Umatilla Hatchery operations will comply with all prudent alternatives contained in the Biological Opinion to reduce competition and predation on chinook salmon and sockeye fry. Continuation of

this program is dependant upon the renewal of the Biological Opinion. In addition, the Umatilla Hatchery will be operated under the NPPC's system policies of adaptive management to guide achievement of fish production goals.

f. Facilities and equipment.

Response: Umatilla Hatchery is located adjacent to the Columbia River, 3.5 miles west of Irrigon, Oregon. Facility rearing units include 34 raceways and 8 troughs. Water is supplied to the hatchery from four remote wells. The hatchery is staffed with 7 FTE's and 1 seasonal employee. The 4 satellite facilities, operated by the CTUIR, located on the Umatilla River (Bonnifer Pond, Minthorne Springs, Imeques, and Thornhollow are used for juvenile fish acclimation. Adults are collected at, held, and distributed from the Threemile Dam facility.

The equipment used at Umatilla Hatchery is state of the art and in good operational condition. Requested Capital Expenditures in FY 1999 include the following items:

- 1) Cushman type personnel and equipment vehicle – New purchase of a small transport and utility hauling vehicle for use in transporting thousands of pounds fish feed from freezer to raceways, tools, equipment, and other items to and from work sites at various locations on the Hatchery grounds. Estimated cost is \$10,500.

g. References.

Response:

Boyce, R.R. 1986. A Comprehensive plan for rehabilitation of anadromous fish stocks in the Umatilla River Basin. Report DOE/BP-18008-1, BPA, Portland, Oregon.

Carmichael, R.W. In press. Straying of Umatilla River hatchery origin fall chinook salmon into the Snake River. In Genetic effects of Straying of Non-Native Hatchery Fish into Natural Populations (R.S. Waples, convenor). National Oceanic and Atmospheric Administration, Seattle, WA.

Contor, C.R., E. Hoverson, and P. Kissner. 1995. Umatilla Basin Natural Production Monitoring and Evaluation. Annual Progress Report 1993-1994 sent to BPA, Portland Oregon.

Contor, C.R., E. Hoverson, and P. Kissner. 1996. Umatilla Basin Natural Production Monitoring and Evaluation. Annual Progress Report 1994-1995 sent to BPA, Portland Oregon.

- Contor, C.R., E. Hoverson, and P. Kissner. 1997. Umatilla Basin Natural Production Monitoring and Evaluation. Annual Progress Report 1995-1996 sent to BPA, Portland Oregon.
- CRITFC, 1996, WY-KAN-USH-MI-WA- KISH-WIT. The Columbia River Anadromous Fish Restoration Plan of the Nez Perce, Umatilla, Warm Springs, and Yakima Tribes. Portland, Oregon.
- CTUIR & ODFW 1989. Umatilla River Subbasin – Salmon and Steelhead plan. Prepared for the NPPC, Portland, Oregon.
- CTUIR & ODFW 1990. Umatilla Hatchery Master Plan. Prepared for the NPPC, Portland, Oregon.
- CTUIR & ODFW 1994. Umatilla Basin Natural Production Monitoring and Evaluation. Annual Progress Report 1992-1993 sent to the BPA, Portland, Oregon.
- IHOT, 1995. Operation Plans for Anadromous Fish Production Facilities in the Columbia River Basin. Vol. II, Oregon.
- Focher, S.M., R.W. Carmichael, M.C. Hayes, and R.W. Stonecypher, Jr. 1997. Umatilla hatchery monitoring and evaluation. 1996 annual progress report to Bonneville Power Administration, Portland, Oregon.
- Hayes, M.C., S.M. Knapp, and A.A. Nigro. 1992. Pages 53-103 *in* S.M. Knapp, editor. Evaluation of juvenile fish bypass and adult fish passage facilities at water diversions in the Umatilla River. Annual and interim progress reports. DOE/BP-10385-2, Bonneville Power Administration, Portland, Oregon.
- Hayes, M.C., R.W. Carmichael, S.M. Focher, N.L. Hurtado, M.L. Keefe, G.W. Love, W.J. Groberg, Jr., S.T. Onjukka, and K. Waln. 1996a. Umatilla Hatchery Monitoring and Evaluation. Annual progress report to Bonneville Power Administration, Portland, Oregon.
- Hayes, M.C., R.W. Carmichael, S.M. Focher, W.J. Groberg, Jr., S.T. Onjukka, R.W. Stonecypher, Jr., and K. Waln. 1996b. Umatilla Hatchery Monitoring and Evaluation. Annual progress report o Bonneville Power Administration, Portland, Oregon.
- Hayes, M.C., R.W. Carmichael, M.L. Keefe, and T.A. Whitesel. (1997). Accuracy of length estimates for chinook salmon and steelhead in compartmented and standard hatchery raceways. *Progressive Fish Culturist* 59:285-292.
- Groberg, W.J., Jr., N.L. Hurtado, S.T. Onjukka, and K. Waln. 1996a. Robert B: Fish Health Monitoring and Evaluation *in* Umatilla Hatchery Monitoring and

- Evaluation. Annual progress report to Bonneville Power Administration, Portland, Oregon.
- Groberg, W.J., Jr., S.T. Onjukka, and K. Waln. 1996b. Report B: Fish Health Monitoring and Evaluation *in* Umatilla Hatchery Monitoring and Evaluation. Annual progress report to Bonneville Power Administration, Portland, Oregon.
- Keefe, M.L., R.W. Carmichael, R.A. French, W.J. Groberg, and M.C. Hayes. 1993. Umatilla hatchery monitoring and evaluation. Annual progress report to Bonneville Power Administration, Portland, Oregon.
- Keefe, M.L., R.W. Carmichael, S.M. Focher, W.J. Groberg, and M.C. Hayes. 1994. Umatilla hatchery monitoring and evaluation. Annual progress report to Bonneville Power Administration, Portland, Oregon.
- Knapp, S.M., J.C. Kern, W.A. Cameron, S.M. Snedaker, and R.W. Carmichael. 1997. Evaluation of juvenile salmonid outmigration and survival in the lower Umatilla River basin. Annual progress report to Bonneville Power Administration, Portland, Oregon.
- NPPC (Northwest Power Planning Council). 1987. Columbia River basin fish and wildlife program (as amended). Northwest Power Planning Council, Portland, Oregon.
- NPPC (Northwest Power Planning Council). 1994. Columbia River basin fish and wildlife program. Northwest Power Planning Council, Portland, Oregon.
- Sokal R.R. and F.J. Rohlf. 1981. Biometry. W.H. Freeman and Company, New York.
- USBR (U.S. Bureau of Reclamation) and BPA (Bonneville Power Administration). 1989. Umatilla basin project. Initial project workplan presented to the Northwest Power Planning Council, May 1989.

Section 8. Relationships to other projects

Response: The products produced from this project annually (salmon and steelhead), are produced in conjunction with the Umatilla Hatchery Master Plan, the Umatilla Basin Natural Production Monitoring and Evaluation and Plan, Umatilla Hatchery Monitoring and Evaluation and the Outmigration and Survival Study. The fish production produced from Umatilla Hatchery provides the foundation for the above monitoring and evaluation projects.

Information obtained on juvenile rearing and migration, adult survival, and recreational fishing is shared with other projects, fish managers, and hatcheries. Information on

rearing and survival data is used by state and federal agencies to improve hatchery programs throughout the Columbia River basin. Information on stray fall chinook salmon is used by the state of Washington and the NMFS to determine if fish releases and adult returns are compatible with the ESA plan for the Snake River fall chinook salmon (meets measure 7.10A.2 of the FWP).

Cooperation and collaboration among all parties and agencies involved in Umatilla basin activities allows sharing of information among projects and sharing of equipment, provides Staff assistance as needed, and creates the opportunity to participate in cross-training activities.

Hatchery staff involve local schools, organizations, other agencies, and scientists interested in their activities, either through field opportunities, classroom lectures, sharing of expertise, equipment, information, or obtaining special permission for specific work.

Section 9. Key personnel

Response:

Hatchery Manager: Jack Hurst; FTE = 1

Assistant Manager: Vacant; FTE = 1

Trades Maintenance Worker: Westley Cone; FTE = 1

Hatchery Technician: Steve Banghart; FTE 1

Hatchery Technician: John Gutchner FTE =1

Hatchery Technician: Clifford Miller FTE =1

Umatilla Fish Hatchery Manager Jack Hurst

Education:

1975 – A.S. Fisheries Technology, Mt. Hood Community College, Gresham, Oregon.

Experience:

3/90-Present, Hatchery Manager, Umatilla Fish Hatchery, 73959 Riverview Ln., Irrigon, Oregon.

Primary responsibilities include, overseeing and implementing hatchery operation plans and programs. This includes coordination with research and evaluation programs assigned to the project, the CTUIR, and the rearing, transferring of spring chinook, fall chinook, and summer steelhead to the Umatilla River. Other responsibilities include, supervising the work of 5 FTE's and ensure proper maintenance programs are conducted on buildings, grounds, and specialized equipment of the facility.

3/89 – 3/90 F&W Technician 2, Cole Rivers Fish Hatchery, ODFW.
7/87 – 3/89 F&W Technician 2, Leaburg Fish Hatchery, ODFW.
6/83 – 7/87 F&W Technician 2, Fall River Fish Hatchery, ODFW.
11/82 – 6/83 F&W Technician 1, Marion Forks Fish Hatchery, ODFW.
2/78 – 11/82 F&W Technician 1, Leaburg Fish Hatchery, ODFW.

Section 10. Information/technology transfer

Response: Refer to projects #8902401, 9000501, and 8802200 ODFW & CTUIR. The project's overall performance will be assessed through completion of the specific measurable objectives, other measures including annual reports, completion of tasks identified in the annual work statements, number of fish tagged/marked and released numbers of adults returning, commercial and sport fishing benefits provided and the achievement of restoring natural runs of adults into the Umatilla River.

Data will be summarized and analyzed and reported in the reports of the projects listed above and in other special reports. Information is communicated to fish management staff through monthly and quarterly reports, and various research reviews, fish propagation meetings, and the Pacific Northwest Fish Culture Conference workshops. Adult fish collection and fish production information is entered and maintained on ODFW's Hatchery Management Information System (HMIS) and available for inclusion within the Coordinated Information System (CIS). Relevant information is also shared with co-managers in the Columbia River Management Plan's Production Advisory Committee (PAC) forum. Other interagency coordination and communication is conducted through the Technical Advisory Committee (TAC), Pacific Northwest Fish Health Protection Committee (PNFHPC), In-River Agreements, and In-season Communications.